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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/016,090	12/13/2001	David Clifford Long	FIS920010163US1	6883

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INTERNATIONAL BUSINESS MACHINES CORPORATION
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EXAMINER

POKER, JENNIFER A

ART UNIT	PAPER NUMBER
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2832

DATE MAILED: 03/13/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/016,090

Applicant(s)

LONG ET AL.

Examiner

Jennifer A. Poker

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 December 2001.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) 14-20 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-13 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 May 2002 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other:

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DETAILED ACTION

Election/Restrictions

1. Applicant's election with traverse of Claims 1-13, drawn to a dielectric substrate, in Paper No. 7 is acknowledged. The traversal is on the ground(s) that the inventions are not independent and distinct as required by the statute, 35 USC 121, however stating that the inventions are distinct (page 2, second full paragraph). This is not found persuasive because the inventions are distinct in the fact that the method of manufacturing a dielectric substrate may in fact be made by a materially different process such as by forming the plurality of layer integrally, and forming apertures in the substrate to allow the legs of the inductors through, as opposed to obtaining a plurality of layers and stacking them.

The requirement is still deemed proper and is therefore made FINAL.

2. Claims 14-20, drawn to a method of forming a dielectric substrate, are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected group, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in Paper No. 7.

Information Disclosure Statement

3. The listing of references in the specification is not a proper information disclosure statement. 37 CFR 1.98(b) requires a list of all patents, publications, or other information submitted for consideration by the Office, and MPEP § 609 A(1) states, "the list may not be incorporated into the specification but must be submitted in a separate paper." Therefore, unless the references have been cited by the examiner on form PTO-892, they have not been considered.

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Although the applicant states that each reference was to be found within the filed application, none were found. If the applicant wishes for the IDS to be considered, the applicant must supply a copy of each document.

4. The information disclosure statement filed December 13, 2001 fails to comply with 37 CFR 1.98(a)(2), which requires a legible copy of each U.S. and foreign patent; each publication or that portion which caused it to be listed; and all other information or that portion which caused it to be listed. It has been placed in the application file, but the information referred to therein has not been considered.

Drawings

5. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the "lines" as claimed in claims 2-6 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

6. The drawings are objected to under 37 CFR 1.83(a) because they fail to show the "lines" as mentioned in the specification. Any structural detail that is essential for a proper understanding of the disclosed invention should be shown in the drawing. MPEP § 608.02(d). A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

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Claim Objections

7. Claim 5 is objected to because recites the limitation "the ends". There is insufficient antecedent basis for this limitation in the claim.

Appropriate correction is required.

8. Claim 6 is objected to because recites the limitation "the length". There is insufficient antecedent basis for this limitation in the claim.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

9. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter, which the applicant regards as his invention.

10. Claims 2-6, 9 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claim 2, the applicant states, "...wherein the top and bottom portions comprise lines situated in respective layer of the dielectric body." The wording of this claim is very ambiguous. Does the applicant mean that the top and bottom portions comprise lines or the dielectric body comprises the lines?

Regarding claim 3, the applicant states, "...wherein the top and bottom portions each comprise two parallel lines in juxtaposition. What "two parallel lines" is the applicant talking about? Is the applicant just stating that the top and bottom portions are located side by side to the next top and bottom portions?

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Regarding claim 9, the applicant states, "...further comprising deleting a portion of the multi-turn inductor." It was unclear what the applicant meant by this limitation. It was understood by the examiner that the inductor was simply reduced in size, making it smaller.

Claim Rejections - 35 USC § 102

11. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) The invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

12. Claims 1-6, 8, 10, and 13 are rejected under 35 U.S.C. 102(e) as being unpatentable by U.S. Patent Number 6,459,352 to Liu, et al.

Liu, et al, discloses a transformer comprising:

- (1) A dielectric area consisting of three different dielectric layers,
- (2) Two inductors, each comprising a number of turns, each turn having a top and a bottom interconnecting portion, parallel to one another but in different layers of the dielectric area, and two side vias parallel to one another and connect the top and bottom portions at their ends.

The top interconnect is located in the top layer of the dielectric area, and the bottom interconnect is located in the bottom layer of the dielectric area.

For the two inductors (windings) located within the dielectric area, a connection to the "inside" terminals, i.e. the terminals at the respective centers of the windings, can be made by tapping into the

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inside terminals from a layer above or below the layer in which the primary winding and the secondary winding are fabricated. Moreover, tapping into the outside terminal can make a connection to the "outside" terminal of the secondary winding from a layer above or below the layer in which the primary winding and the secondary winding are fabricated. (Abstract) (Figure 1) (Columns 9 and 10, lines 66-67 and 1-5 respectively)

Claim Rejections - 35 USC § 103

13. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

14. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S Patent Number 6,459,352 to Liu, et al, in view of U.S. Patent Number 5,884,990 to Burghartz, et al.

Liu, et al, discloses the claimed invention except for the toroidal shape of the inductor.

Burghartz, et al, discloses a high quality factor spiral and toroidal inductor and transformer deposited in a trench formed in a dielectric layer. A toroidal inductor has a larger inductance than the spiral inductor. The magnetic flux is confined within the loop and does not stray, which allows for high Q-factors at high inductance values and reduces the possibility for coupling between adjacent inductors. (Column 8, lines 56-67)

One skilled in the art, at the time the invention was made, would have found it obvious to combine the teachings of Liu, et al, with the teachings of Burghartz, et al, and form a toroidal shaped inductor in order to allow for high Q-factors and to reduce the possibility of coupling between adjacent inductors.

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15. Claim 9 is rejected under 35 U.S.C. 103(a) as being obvious over U.S. Patent Number 6,459,352 to Liu, et al.

Liu, et al, states, that an individual inductor's size limits the use of inductors to build transformers for RF and mixed signal circuits. Second, the inductor's quality factor would be too low. It would have been obvious to one having ordinary skill in the art, at the time the invention was made, to utilize the teachings of Liu, et al, and incorporate a way of decreasing the size of the inductor within the dielectric are in order to increase the inductance. (Column 3, lines 1-3)

16. Claims 11 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent Number 6,459,352 to Liu, et al, in view of U.S. Patent Number 5,461,353 to Eberhardt.

Liu, et al, discloses the claimed invention except for the plate added to tune the inductor.

Eberhardt discloses a printed circuit board inductor wherein an inductance tuning means, such as metallized runners, are incorporated. (Column 4, lines 53-63) The inductance adjustment runners are metallized runners, which short some of the turns of inductor. In order to increase the inductance value of inductor, one or more of the adjustment runners are cut using well known laser trimming equipment or by simply mechanically cutting one or both runners. (Column 3, lines 51-60)

One skilled in the art, at the time the invention was made, would have found it obvious to combine the teachings of Liu, et al, with the teachings of Eberhardt and incorporate an inductance tuning means such as metallized runners connected to the inductors in order to increase or decrease the inductance.

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Conclusion

17. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

U.S. Patent Number 6,008,102 to Alford, et al, discloses a method forming a three-dimensional integrated inductor.

U.S. Patent Number 6,292,086 to Chu discloses a high-Q inductor device formed within a substrate.


Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jennifer A. Poker whose telephone number is 703-305-4037. The examiner can normally be reached on 6:00-3:30, Mon.-Fri. (alternating Fridays off).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Elvin G. Enad can be reached on 703-308-7619. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-7722 for regular communications and 703-308-7724 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-1782.

jap
March 7, 2003


ELVIN ENAD
SUPERVISORY PATENT EXAMINER
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03/07/03